

# Carotid Artery Stroke in Early Post Partum Period: A Case Report

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**Abstract:** Stroke is a neurological deficit caused by ischemia or haemorrhage. Pregnancy being a hypercoagulable state, predisposes a lady for higher risk of stroke. The current case was a 34 yrs old 2<sup>nd</sup> Para who presented with sudden onset symptoms of stroke in the early post partum period. She was immediately diagnosed with Internal carotid artery thrombus and underwent mechanical thrombectomy within the golden hour. This could salvage all her motor and sensory functions completely without any remaining deficit. It is pertinent to reemphasize the importance of diagnosing the cause of stroke and instituting the treatment within the golden hour.

**Keywords:** Stroke, Post partum, Gestational Hypertension, Thrombectomy

## 1. Introduction

Stroke is defined as a neurological deficit attributed to acute focal injury of the central nervous system by a vascular cause, including cerebral infarction, cerebral vein thrombosis (CVT), intracranial haemorrhage (ICH) and subarachnoid haemorrhage.

Of Strokes in pregnant women half are ischemic and half are haemorrhagic [1]. There is an increased risk of stroke during pregnancy and the postpartum period with the risk greatest deemed to be in the immediate post-partum period.

A systematic review and meta-analysis of stroke in pregnancy, which included 11 studies published between 1990 and January 2017, reported an incidence of 30 per 100 000 pregnancies – three times the incidence in nonpregnant female individuals aged 15–44 years. [2]

In a study of 145 women, approximately 45 % patients had stroke antenatally, 3% had intrapartum and majority 53 % patients had it in post partum period [3]

Several risk factors have been reported from studies that included more than 10 million pregnancies. These are elderly gravida, hypertension, obesity, diabetes, cardiac disorders, valvular prostheses, smoking, obstetrical hemorrhage, and cesarean delivery.

By far, the most common risk factor is pregnancy-associated hypertensive disorders. A third of strokes are associated with gestational hypertension, and hypertensive women compared with normotensive counterparts have a three- to eightfold greater risk of stroke [4, 5]

We are presenting a rare case of stroke in the early postpartum period. The case report discusses her presentation, investigations and management of stroke.

## 2. Case Report

The patient was a 34 yr old G3 P1 L1 A1 with a caesarean delivery 5 years ago. She presented at 33wks3 days period of gestation with reduced perception of fetal movements for last 1 week with a solitary episode of bleeding per vaginum 2 days back. On admission evaluation she was found to be hypertensive with BP of 146/96 mm of Hg with Breech presentation and non-reassuring fetal heart rate pattern (Persistent variable deceleration) {Cat III CTG}. Her last obstetric ultrasound revealed Fetal growth restriction (estimated fetal weight – 1372 gms) with Umbilical artery SD ratio- 4.69.

Pt was immediately taken up for emergency caesarean delivery in view of non-reassuring FHR pattern. She delivered a live female baby of 1204 gms. Baby cried immediately, but had RDS, hence was shifted to NICU for further management. Till Post op Day 2, patient had expected recovery but her blood pressure remained on higher side (140-150/ 90-96 mm of Hg) but with no danger signs. Suddenly on Post op day 3, she started complaining of sudden onset slurring of speech with weakness of right half of body. Had no syncope/seizures/loss of consciousness/bowel-bladder incontinence.

## 3. On Examination

GCS	15/15
Pupils	NSRL
BMI	32.86 Kg/m <sup>2</sup>
Vitals	P- 88/min, BP- 152/98 mm of Hg, RR-20/min, SpO <sub>2</sub> - 98 % @ room air,
Speech	Slurred but comprehensible
Power	Rt Hemiparesis ( 2/5)
Plantar reflex	Rt- Extensor, Lt- Flexor
NIHSS	7
Other systemic examination	Unremarkable
CT Scan of brain with CT Angiography of cerebral vessels	Distal Intracranial left internal carotid artery (ICA) occlusion.

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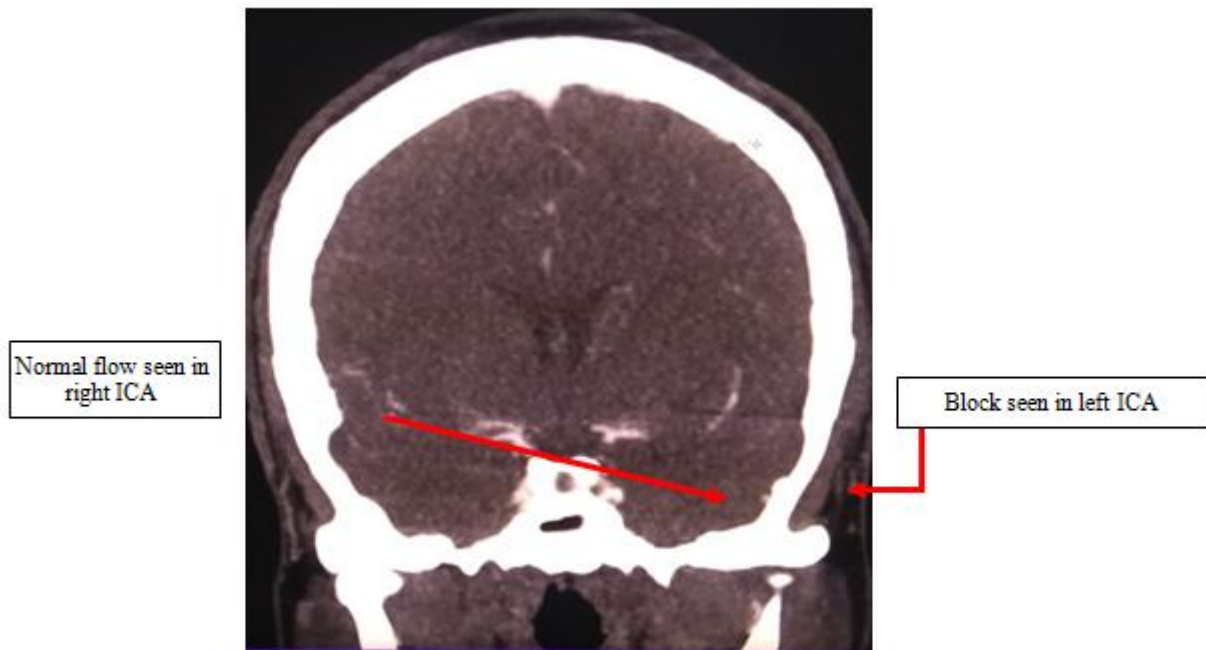


Figure 1: CT angiogram: Coronal View

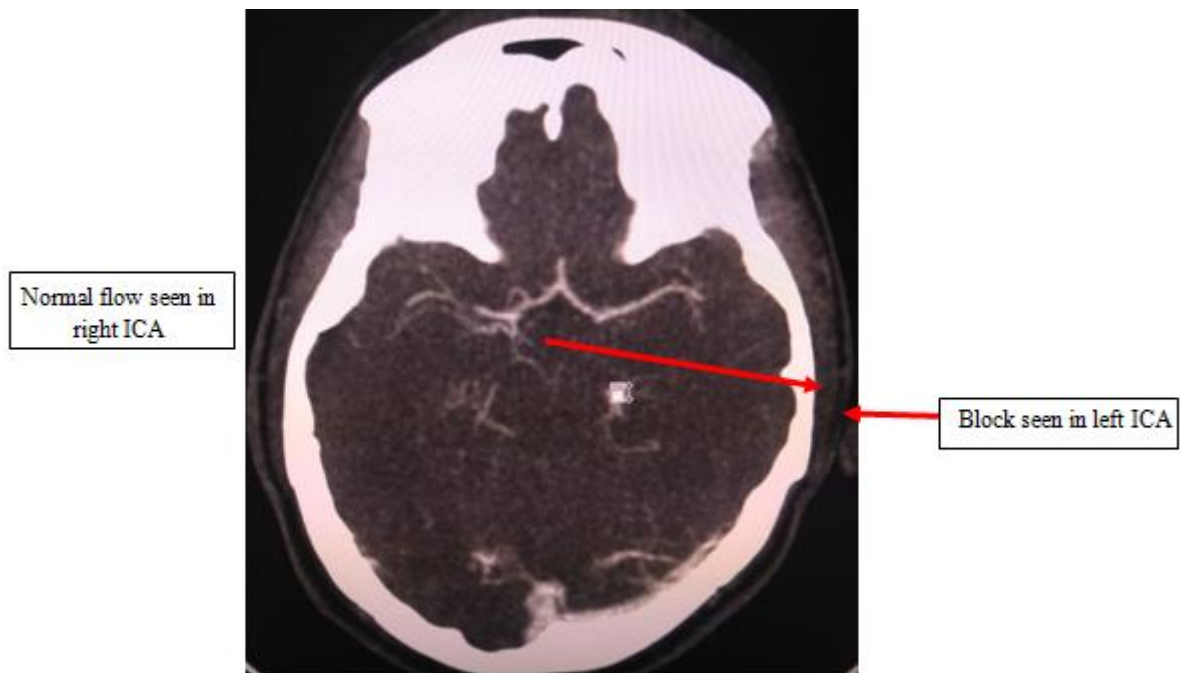


Figure 2: CT angiogram: Transverse view

Thrombolysis could not be done in view of recent major surgery (Cesarean Delivery)

Patient was immediately taken up for Mechanical thrombectomy under local anaesthesia at our interventional radiology centre within the Golden hour.



Figure 3: Clots post removal



Figure 4: Post thrombectomy: Showing free flow

Procedure went uneventful with complete post procedure recovery of power and speech.

#### 4. Evaluation

ACLA IgG /IgM	Negative
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Protein C	155 % (70-140) – Normal
Protein S	102 % (65-130)- Normal
Anti Thrombin-III	86 % (80-120)- Normal
Activated Protein CResistance (APCR)	152.2 secs ( >120 secs)- Normal
2D ECHO	Normal
MRI & MRA Brain	Small acute infarcts in left insular, frontal and thalamus area with normal flow in distal left ICA

The patient was then put on antiplatelet and anti-hypertensive medications.

Patient was discharged on post-operative day five with the standard of care at our hospital.

#### 5. Discussion

This case concerns a rare presentation of postpartum cerebral infarction involving the left internal carotid artery. The pathophysiology of cerebral infarction in pregnancy and the postpartum period is related to the significant haemodynamic changes during pregnancy.

Blood volume increases by 40-45% above the non-pregnant value after 32-34 weeks period of gestation predominantly due to the increased capacity of the uterine, breast, renal, striated muscle and cutaneous vascular systems.

There is a greater increase of plasma volume relative to that of the red cell mass leading to a state of haemodilution and a decrease in haemoglobin concentration. This serves to facilitate maternal and fetal exchanges and provide adequate blood supplies to manage blood loss at delivery.

In addition to increases in red cell mass and plasma volume, fibrinogen, factors VII, X and XII as well as the number of platelets rise to the upper limits of normal resulting in a

relatively hypercoagulable state. There is a rise in cardiac output during pregnancy and following delivery to compensate for these changes, primarily due to an increase in stroke volume and heart rate and a steady reduction in systemic vascular resistance.

In a single-centre study examining women diagnosed with postpartum stroke, of the twenty women included, six were diagnosed with arterial cerebral infarction with a mean time of occurrence at eight days post-partum (range: 3-35 days), as seen in our patient who had it on Post op day 3 .[6]

They found an association between post partum stroke and caesarean section and hypertensive disorders of pregnancy, both of which our patient had experienced. Other risk factors identified include pre-existing or pregnancy-related hypertension and eclampsia, diabetes, sickle cell disease, thrombophilia, smoking and heart disease.

Management of stroke is of utmost importance .It is imperative that a ‘time is brain’ and ‘Golden Hour’ approach is adopted in the management of acute stroke. Time-sensitive and reperfusion therapies are associated with improved functional outcomes.

Regarding thrombolysis safety and efficacy in the early postpartum period (<14 days after delivery) are not well established. A history of major surgery within the preceding 2 weeks is a relative contraindication for systemic thrombolytic therapy. This curtails its use after a caesarean section as seen in our case.

Other alternative for treatment available to us is Mechanical thrombectomy. The HERMES meta-analysis of 5 RCTs showed that mechanical thrombectomy with stent retriever devices was superior to intravenous rt-PA alone in acute anterior circulation ischaemic stroke. [7] All eligible patients with a large vessel occlusion on CT angiogram should be considered for clot retrieval and urgently referred to a neurointerventional centre as done in our case.

#### 6. Conclusion

This patient had certain risk factors related to her general condition (Obesity) and pregnancy (Gestational hypertension, Cesarean delivery) both which attributed to the Stroke in the early post partum period. It was in time that the patient was diagnosed and offered appropriate therapy within the golden hour to salvage her most of the motor and sensory functions. Fortunately in our patient’s case her prognosis was excellent.

#### 7. Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images

#### 8. Competing Interests

The authors declare that they have no competing interests.

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